



## International study of temperature, heat and urban mortality: The 'ISOTHURM' project

**Author(s):** McMichael AJ, Wilkinson P, Kovats RS, Pattenden S, Hajat S, Armstrong B, Vajanapoom N, Niciu EM, Mahomed H, Kingkeow C, Kosnik M, O'Neill MS, Romieu I, Ramirez-Aguilar M, Barreto ML, Gouveia N, Nikiforov B  
**Year:** 2008  
**Journal:** International Journal of Epidemiology. 37 (5): 1121-1131

### Abstract:

**BACKGROUND:** This study describes heat- and cold-related mortality in 12 urban populations in low- and middle-income countries, thereby extending knowledge of how diverse populations, in non-OECD countries, respond to temperature extremes. **METHODS:** The cities were: Delhi, Monterrey, Mexico City, Chiang Mai, Bangkok, Salvador, Sao Paulo, Santiago, Cape Town, Ljubljana, Bucharest and Sofia. For each city, daily mortality was examined in relation to ambient temperature using autoregressive Poisson models (2- to 5-year series) adjusted for season, relative humidity, air pollution, day of week and public holidays. **RESULTS:** Most cities showed a U-shaped temperature-mortality relationship, with clear evidence of increasing death rates at colder temperatures in all cities except Ljubljana, Salvador and Delhi and with increasing heat in all cities except Chiang Mai and Cape Town. Estimates of the temperature threshold below which cold-related mortality began to increase ranged from 15 degrees C to 29 degrees C; the threshold for heat-related deaths ranged from 16 degrees C to 31 degrees C. Heat thresholds were generally higher in cities with warmer climates, while cold thresholds were unrelated to climate. **CONCLUSIONS:** Urban populations, in diverse geographic settings, experience increases in mortality due to both high and low temperatures. The effects of heat and cold vary depending on climate and non-climate factors such as the population disease profile and age structure. Although such populations will undergo some adaptation to increasing temperatures, many are likely to have substantial vulnerability to climate change. Additional research is needed to elucidate vulnerability within populations.

**Source:** <http://dx.doi.org/10.1093/ije/dyn086>

### Resource Description

#### Communication:

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

#### Communication Audience:

audience to whom the resource is directed

Policymaker

# Climate Change and Human Health Literature Portal

## **Exposure :**

weather or climate related pathway by which climate change affects health

Air Pollution, Meteorological Factors, Temperature

**Air Pollution:** Ozone, Particulate Matter

**Temperature:** Extreme Cold, Extreme Heat

## **Geographic Feature:**

resource focuses on specific type of geography

Urban

## **Geographic Location:**

resource focuses on specific location

Global or Unspecified

## **Health Impact:**

specification of health effect or disease related to climate change exposure

Injury

## **Mitigation/Adaptation:**

mitigation or adaptation strategy is a focus of resource

Adaptation

## **Population of Concern:** A focus of content

## **Population of Concern:**

populations at particular risk or vulnerability to climate change impacts

Children, Elderly, Low Socioeconomic Status

## **Resource Type:**

format or standard characteristic of resource

Research Article

## **Timescale:**

time period studied

Time Scale Unspecified

## **Vulnerability/Impact Assessment:**

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content